What is claimed is:

1. A document image processing device, comprising:

5   character region extracting unit extracting character regions respectively from a plurality of document images which are partitioned and read;

character recognizing unit recognizing character images within the character regions extracted by said

10   character region extracting unit;

overlapping detecting unit detecting an overlapping of the plurality of document images based on character recognition results of the respective document images, which are obtained by said character

15   recognizing unit; and

image merging unit merging the plurality of document images at an overlapping position detected by said overlapping detecting unit.

20   2. A document image processing device, comprising:

character region extracting unit extracting character regions respectively from a plurality of document images which are partitioned and read;

25   overlapping detecting unit detecting character

regions whose matching degrees are high by making a comparison between positions and sizes of the respective character regions extracted by said character region extracting unit, and detecting an

5 overlapping of the plurality of document images based on positions of the detected character regions whose matching degrees are high; and

image merging unit merging the plurality of document images at an overlapping position detected

10 by said overlapping detecting unit.

3. A document image processing device, comprising:

character region extracting unit extracting

15 character regions respectively from a plurality of document images which are partitioned and read;

character recognizing unit recognizing character images within the character regions extracted by said character region extracting unit;

20 overlapping detecting unit detecting an overlapping of the plurality of document images based on character recognition results of the respective document images, which are obtained by said character recognizing unit, and on a result of a comparison

25 between positions and sizes of the respective

character regions in the plurality of document images, which are extracted by said character region extracting unit; and

image merging unit merging the plurality of document images at an overlapping position detected by said overlapping detecting unit

4. The document image processing device according to claim 1, wherein said character region extracting unit extracts a plurality of character regions in line images in the plurality of document images.

5. The document image processing device according to claim 1, wherein said overlapping detecting unit detects as an overlapping position of line images whose matching degrees are high by making a comparison between character regions in line images in a direction from edges of the plurality of document images to their centers.

6. The document image processing device according to claim 1, wherein:

the plurality of document images which are partitioned and read are two document images; and

said overlapping detecting unit detects an overlapping position of the two document images by making a comparison between character regions in line images in the two document images.

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7. The document image processing device according to claim 1, wherein said overlapping detecting unit regards as detection targets character regions in particular regions in the plurality of

10 document images.

8. The document image processing device according to claim 1, wherein said overlapping detecting unit detects an overlapping position

15 sequentially from a direction with a higher priority among a plurality of detection directions.

9. The document image processing device according to claim 8, wherein said overlapping

20 detecting unit determines an overlapping position detection direction depending on whether or not the document images are written either vertically or horizontally.

25 10. The document image processing device

according to claim 1, wherein said overlapping detecting unit detects an overlapping position only in a particular direction.

5   11. The document image processing device according to claim 1, wherein said character region extracting unit extracts a region enclosed by a tetragon circumscribed to a character image as a character region.

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12. A document image merging method, comprising:
        recognizing character images;
        detecting an overlapping of the plurality of document images based on character recognition results
15   of the respective document images which are partitioned and read; and
        merging the plurality of document images at a detected overlapping position.

20   13. A document image merging method, comprising:
        detecting a plurality of character regions whose matching degrees are high by making a comparison between positions and sizes of the respective character regions in the respective document images;
25   detecting an overlapping of the plurality of

document images based on positions of the plurality of character regions whose matching degrees are high; and

merging the plurality of document images at a

5 detected overlapping position.

14. A document image merging method, comprising:

recognizing character images;

detecting an overlapping of the plurality of

10 document images based on character recognition results of the respective document images, and on a result of a comparison between positions and   sizes of the respective character regions in the plurality of document images; and

15 merging the plurality of document images at a detected overlapping position.

15. A   document   image   processing   device, comprising:

20 region   partitioning   unit   partitioning   an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

25 line image extracting unit extracting line images

respectively from the plurality of regions partitioned by said region partitioning unit;

overlapping detecting unit detecting an overlapping position of the plurality of document images based on positions of character regions whose matching degrees are high by making a comparison between character regions in the line images in the respective regions, which are extracted by said line image extracting unit; and

image merging unit merging the plurality of document images at the overlapping position detected by said overlapping detecting unit.

16. A document image processing device, comprising:

region partitioning unit partitioning an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

line image extracting unit extracting line images respectively from the plurality of regions partitioned by said region partitioning unit;

character recognizing unit recognizing character images in the line images within the respective

regions, which are extracted by said line image extracting unit;

overlapping detecting unit detecting an overlapping position of the plurality of document images based on character recognition results of one or a plurality of regions in the respective document images, which are obtained by said character recognizing unit; and

image merging unit merging the plurality of document images at the overlapping position detected by said overlapping detecting unit.

17. A document image processing device, comprising:

region partitioning unit partitioning an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

line image extracting unit extracting line images respectively from the plurality of regions partitioned by said region partitioning unit;

overlapping detecting unit detecting a plurality of character regions whose matching degrees are high by making a comparison between positions and sizes of

a plurality of character regions in the line images extracted by said line image extracting unit, and detecting an overlapping position of the plurality of document images based on the positions of the detected

5 character regions; and

image merging unit merging the plurality of document images at the overlapping position detected by said overlapping detecting unit.

10 18. The document image processing device according to claim 15, wherein:

said region partitioning unit partitions the plurality of document images into a plurality of regions in a vertical and a horizontal direction; and

15 said line image extracting unit makes a comparison between the number of line images extracted from a region partitioned in the vertical direction in the plurality of document images and the number of line images extracted from a region partitioned in the

20 horizontal direction, and recognizes a line image direction of a region including a larger number of line images as a line image direction of the plurality of document images.

25 19. The document image processing device

according to claim 15, wherein said line image extracting unit detects pixels for one pixel line in a partitioned region, and detects pixel lines including a predetermined or larger number of black pixels as black pixel lines, and other lines as white pixel lines.

20. The document image processing device according to claim 19, wherein said line image extracting unit detects pixels in the partitioned regions in line units in a direction vertical to a partitioning bar of the regions partitioned by said region partitioning unit.

21. The document image processing device according to claim 19, wherein said line image extracting unit extracts as a black pixel region a region where the number of successive black pixel lines is within a predetermined range.

22. The document image processing device according to claim 21, wherein said line image extracting unit extracts as a white pixel region a region where the number of successive white pixel lines is equal to or larger than a predetermined

value.

23. The document image processing device according to claim 15, wherein said region partitioning unit changes a partitioned region size depending on a resolution of a read document image.

24. The document image processing device according to claim 21, wherein said line image extracting unit changes the number of black pixel lines regarded as black pixel regions depending on a resolution of a read document image.

25. The document image processing device according to claim 21, wherein said line image extracting unit extracts a black pixel regina adjacent a white pixel region satisfying a predetermined condition an as a line image.

26. The document image processing device according to claim 18, wherein said overlapping detecting unit detects character regions whose matching degrees are high as an overlapping position by making a comparison between character regions in the line images in the plurality of partitioned

regions in the direction of the larger number of line images, which are extracted by said line image extracting unit.

5   27. The document image processing device according to claim 15, wherein said overlapping detecting unit stores a detection frequency of a line image which was previously detected as an overlapping position of a document image in correspondence with

10   identification information assigned to the line image, and detects an overlapping position by giving precedence to a line image with a high detection frequency.

15   28. The document image processing device according to claim 15, wherein said overlapping detecting unit makes a comparison between the line images in the respective regions in a predetermined order.

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       29. A document image processing device, comprising:
       region partitioning unit partitioning an arbitrary number of document images among a plurality

25   of document images which are partitioned and read, or

the respective document images into a plurality of regions;

line image extracting unit extracting line images respectively from the plurality of regions partitioned by said region partitioning unit;

overlapping detecting unit detecting an overlapping position of the plurality of document images based on positions of character regions whose matching degrees are high by making a comparison between character regions in the line images in the respective regions, which are extracted by said line image extracting unit;

image merging unit merging the plurality of document images at the overlapping position detected by said overlapping detecting unit; and

setting unit allowing a setting of whether or not to automatically merge the plurality of document images on a display screen.

30. The document image processing device according to claim 29, wherein said setting unit is an operation button displayed on the display screen.

31. The document image processing device according to claim 29, wherein said setting unit with

which a user can set the number of merging sheets of document images.

32.   A document image merging method, comprising:

5   partitioning an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

extracting line images respectively from the

10   plurality of partitioned regions;

detecting an overlapping position of the plurality of document images based on positions of character regions whose matching degrees are high by making a comparison between character regions in the

15   line images in the respective regions; and

merging the plurality of document images at the detected overlapping position.

33.   A document image merging method, comprising:

20   partitioning an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

extracting line images respectively from the

25   plurality of partitioned regions;

recognizing character images in character regions within the extracted line images;

detecting an overlapping position of the plurality of document images based on character

5   recognition results of the respective regions; and

merging the plurality of document images at the detected overlapping position.

34.   A document image merging method, comprising:

10   partitioning an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

extracting line images respectively from the

15   plurality of partitioned regions;

detecting an overlapping position of the plurality of document images based on positions of the extracted line image whose matching degrees are high; and

20   merging the plurality of document images at the detected overlapping position.

35.   A document image merging method, comprising:

making a display to allow a setting of whether

25   or not to automatically merge a plurality of document

images which are partitioned and read on a display screen;

partitioning an arbitrary number of document images among the plurality of document images, or the

5   respective document images into a plurality of regions;

extracting line images respectively from the plurality of partitioned regions;

recognizing character images in character regions

10   within the extracted line images;

detecting an overlapping position of the plurality of document images based on positions of character regions whose matching degrees are high by making a comparison between character regions in the

15   line images in the respective regions; and

merging the plurality of document images at the detected overlapping position.

36. A computer-readable storage medium on which

20   is recorded a program for causing a computer to execute a document image merging process, said process comprising:

extracting character regions respectively from a plurality of document images which are partitioned

25   and read;

detecting character regions whose matching degrees are high by making a comparison between a plurality of character regions in the plurality of document images based on positions and sizes of the

5 character regions, and detecting an overlapping position of the plurality of document images based on positions of the character regions whose matching degrees are high; and

merging the plurality of document images at the

10 detected overlapping position.

37. A computer-readable storage medium on which is recorded a program for causing a computer to execute a document image merging process, said process

15 comprising:

extracting character regions respectively from a plurality of document images which are partitioned and read;

recognizing character images within the extracted

20 character regions;

detecting an overlapping position of the plurality of document images based on character recognition results of the respective document images and on a result of a comparison between positions and

25 sizes of the plurality of character regions in the

plurality of document images; and

merging the plurality of document images at the detected overlapping position.

5   38. A computer-readable storage medium on which is recorded a program for causing a computer to execute a document image merging process, said process comprising:

partitioning an arbitrary number of document
10   images among a plurality of document images which are partitioned and read, or the respective document images into a plurality of regions;

extracting line images respectively from the plurality of partitioned regions;

15   detecting an overlapping position of the plurality of document images based on positions of character regions whose matching degrees are high by making a comparison between character regions in the line images within the respective regions; and

20   merging the plurality of document images at the detected overlapping position.

39. A computer-readable storage medium on which is recorded a program for causing a computer to
25   execute a document image merging process, said process

comprising:

partitioning an arbitrary number of document images among a plurality of document images which are partitioned and read, or the respective document
5   images into a plurality of regions;

extracting line images respectively from the plurality of partitioned regions;

recognizing character images within character regions in the line images in the respective regions;
10   detecting an overlapping position of the plurality of document images based on character recognition results of the respective regions; and

merging the plurality of document images at the detected overlapping position.
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40.   A computer-readable storage medium on which is recorded a program for causing a computer to execute a document image merging process, said process comprising:
20   making a display to allow a setting of whether or not to automatically merge a plurality of document images which are partitioned and read on a display screen;

partitioning an arbitrary number of document
25   images among the plurality of document images, or the

respective document images into a plurality of regions;

extracting line images respectively from the plurality of partitioned regions;

5   recognizing character images in character regions within the extracted line images;

detecting an overlapping position of the plurality of document images based on positions of character regions whose matching degrees are high by

10   making a comparison between character regions in the line images in the respective regions; and

merging the plurality of document images at the detected overlapping position.

15   41. A document image processing device, comprising:

character region extracting means for extracting character regions respectively from a plurality of document images which are partitioned and read;

20   character recognizing means for recognizing character images within the character regions extracted by said character region extracting means;

overlapping detecting means for detecting an overlapping of the plurality of document images based

25   on character recognition results of the respective

document images, which are obtained by said character recognizing means; and

image merging means for merging the plurality of document images at an overlapping position detected by said overlapping detecting means.